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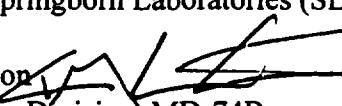
OFFICE OF
RESEARCH AND DEVELOPMENT

CROFTON, 1998b

MEMORANDUM

Date: 21 July 1998 (revised 12 October 1998; revised 18 November 1998)

Subject: Re-Analysis of Thyroid Hormone Data from the Subchronic Perchlorate Study
Submitted by Springborn Laboratories (SLI Study No. 3455.1)

From: Kevin M. Crofton

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To: Annie Jarabek
National Center for Environmental Assessment

Attached is a re-analysis of the thyroid hormone data from the 90-day perchlorate study (Springborn, 1998; SLI#3455.1). I have also attached a short description of how and why the analysis was done and some summary graphs.

The November 18 revision contains a correction for the 14 day TSH NOAELs (see p. 4).

NOTE: The raw data analyzed herein has not been formally submitted to the Agency at the time of this analysis. Changes were also made to the submitted data in October as documented in Appendix 1.

**Re-Analyses of Thyroid Hormone Data from the
Subchronic Perchlorate Study (SLI Study No. 3455.1)**

dspj/jmg

Summary: The report on a 90-day perchlorate drinking water study, submitted by Springborn (1998), included an appendix (Appendix I) containing thyroid hormone data. This appendix was supplied by the Sponsor (AFRL/HEST) to Springborn Laboratories (Springborn, 1998), and contained summary data on thyroid hormone analyses (T3, T4 and TSH). The original report used a series of individual ANOVAs to determine main effects of treatment for all three hormones in two genders and at three time-points during the study (Day14, Day90 and a Day120 recovery time).

This data was re-analyzed using three-way ANOVAs, one for each of the three hormones. This new analysis allowed for a statistical comparison of the interaction between gender, time and treatment. The new analysis also contains a printout of all of the raw individual animal data, an omission from the Springborn study. Results of these re-analyses are similar to those stated in the Springborn report with a few notable exceptions. First, there is only a marginal interaction between gender and treatment. This interaction results from slight differences in magnitude of effects between genders, but no differences in LOAELs between genders (with minor exceptions likely due to small changes in variance between group and probably not biological significant - see below). Second, the new analyses failed to detect a significant effect of perchlorate on TSH at the 120-day time point.

The data demonstrate a dosage- and time-dependent effect of perchlorate on thyroid hormones that partially recovers 30 days after cessation of treatment. The LOAEL, based on decreases in T3 and T4 at 90 days, is 0.01 mg/kg/day. No NOAEL could be calculated for T3 and T4. The NOAEL for TSH is 0.05 mg/kg/day based on significant increases in both genders on both Day 14 and Day 90.

Data Source: All data was supplied by Dr. David Mattie, AFRL/HEST, Wright-Patterson AFB in individual Microsoft Excel spreadsheets for each gender and time point. These were appended into one file and data were exported to ascii format. The ascii file was used as input for SAS analyses.

Note that corrections were made to the data files that were submitted (Appendix 1). During Agency review of the data it was noticed that a number of animal ids were duplicated and one animal had an incorrect dose code. Corrections were made with the help and agreement of Dr. David Mattie, WPAFB during a series of phone calls during the month of October, 1998.

Data Analysis - Methods: Data from each hormone were subjected to separate three-way ANOVAs, with Day (Day 14, Day 90 and Day 120), Gender (male and female), and Treatment (dose) as independent between-subjects variables. Dependent variables were T3, T4 and TSH. Step-down ANOVAs where conducted as indicated by significant interactions. Mean contrasts were performed using Tukey's Studentized Range (HSD) Test. To correct for multiple

comparisons (i.e., three separate three-way ANOVAs) the acceptable alpha for significance was corrected to 0.0289 (alpha of 0.05 divided by the square root of the number of main comparisons). SAS analysis code and output are attached (Appendix 2).

Data Analysis - Results:

Total Serum Thyroxine (T4): The overall Day*Gender*Treatment interaction was not significant, but there were significant Day*Treatment and Gender*Treatment interactions. Thus, subsequent step-down ANOVAs were conducted as follows: 1) main effects of treatment at each time point, and 2) main effects of treatment for each gender. These data are plotted in Figures 1 and 2. Figure 1 clearly indicates that perchlorate decreases T4 in a time- and dose-related manner. The effect at the 14-day time point was limited to the high dose only. The potency increased at the 90-day time point where all doses were significantly different from controls. There appears to be a lack of recovery at the 120-day time point, however, the lack of an 0.01 mg/kg/day group at this time makes a definitive conclusion difficult.

Figure 2 illustrates the significant Gender*Treatment interaction. Although the interaction was significant due to the slightly greater magnitude of the effect in males, the NOAELs were not different between the genders supporting the conclusion that both genders are equally susceptible to the hypothyroxinemic effects of perchlorate.

Total Serum Triiodothyronine (T3): There was a significant Day*Gender*Treatment interaction and subsequent step-downs ANOVAs showed significant Gender*Treatment interactions for the 14- and 90-day time points. Therefore, separate ANOVAs were conducted on each gender to test for a main effect of treatment. Lack of a significant Gender*Treatment interaction on the 120-day data led to one subsequent ANOVA to test for a main effect of treatment. Data from Day 14 revealed a LOAEL of 0.01 mg/kg/day for males (see Figure 4). There was no statistically significant effect of any dose of perchlorate on females at Day 14. The LOAEL for males and females was 0.01 on Day 90. The LOAEL for T3 at Day 120 was 10 mg/kg/day, with a NOAEL at 1 mg/kg/day, indicative of a recovery of T3 concentrations after cessation of treatment.

Note: The lack of effect of perchlorate on T3 in female rats at the 14-day time point may be artifactual. Historical control data from this laboratory (supplied by Dave Mattie and Daryl Dodd - not plotted on the figure for the Day 14) include, the Day90 and 120 time points, as well as data from one other study (group means are 170, 224, 169, respectively). These historical data show that the group mean for females in Figure 3 for the 14 day time point may be artificially low relative to some of the other data from this lab. Thus, the biological significance of this gender-dependent effect of perchlorate after 14-days of exposure is suspect. Consistent with this conclusion is the significant dose-dependent decrease in T3 concentrations in female rats exposed to 0.125 - 250 mg/kg/day perchlorate in a previous 14-day exposure study by this same laboratory (Caldwell et al., 1995).

Total Thyroid Stimulating Hormone (TSH): There was a significant Day*Gender*Treatment interaction and subsequent step-down ANOVAs showed a significant Gender*Treatment

interaction for the 14-day time point only. Therefore, separate ANOVAs were conducted on each gender to test for a main effect of treatment for the 14-day time point. Lack of a significant Gender*Treatment interaction for the 90- and 120-day data led to subsequent one-way ANOVAs at each time point to test for a main effect of treatment. Perchlorate caused a dose-dependent increase in TSH that was apparent at the 14 and 90-day time points (see figure 4). The NOAEL for the Day 14 data was 0.01 mg/kg/day for the females and 0.05 mg/kg/day for the males. This difference between males and females is likely due to small changes in variance between groups and not a biological significant difference [the absolute increase relative to the control mean in the 0.05 mg/kg/day female group is actually smaller than the same comparison in the males]. TSH concentrations recovered to control values 30 days after cessation of treatment.

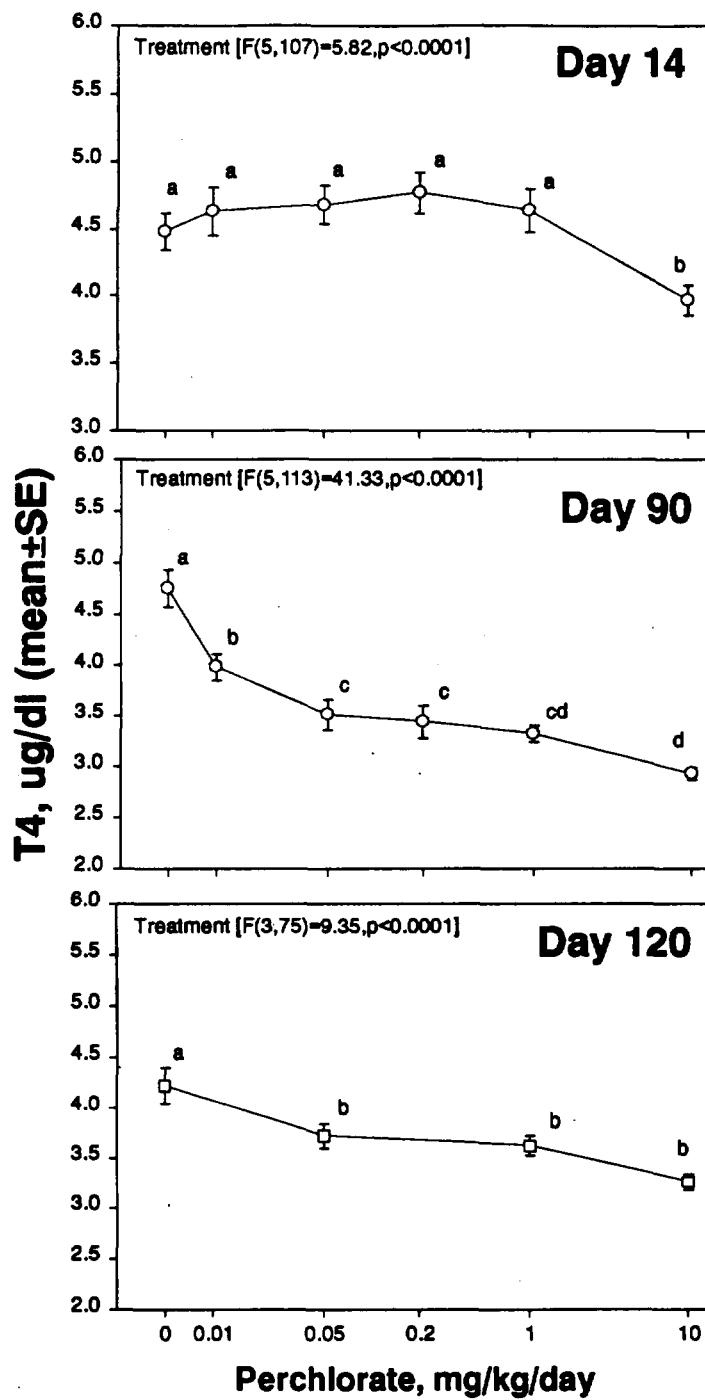


Figure 1. Effects of 90-day exposure to perchlorate on serum total thyroxine (T4) concentrations. There was no Day*Gender*Treatment interaction [$F(8,279)=1.22, p<0.2862$], but there was a main Day*Treatment interaction [$F(8,279)=6.84, p<0.0001$], therefore data were collapsed across gender and plotted by dose for each Day. Means with different letters were significantly different ($p<0.05$, Tukey's after significant main effect). The 120-day time-point is 30 days after cessation of exposure.

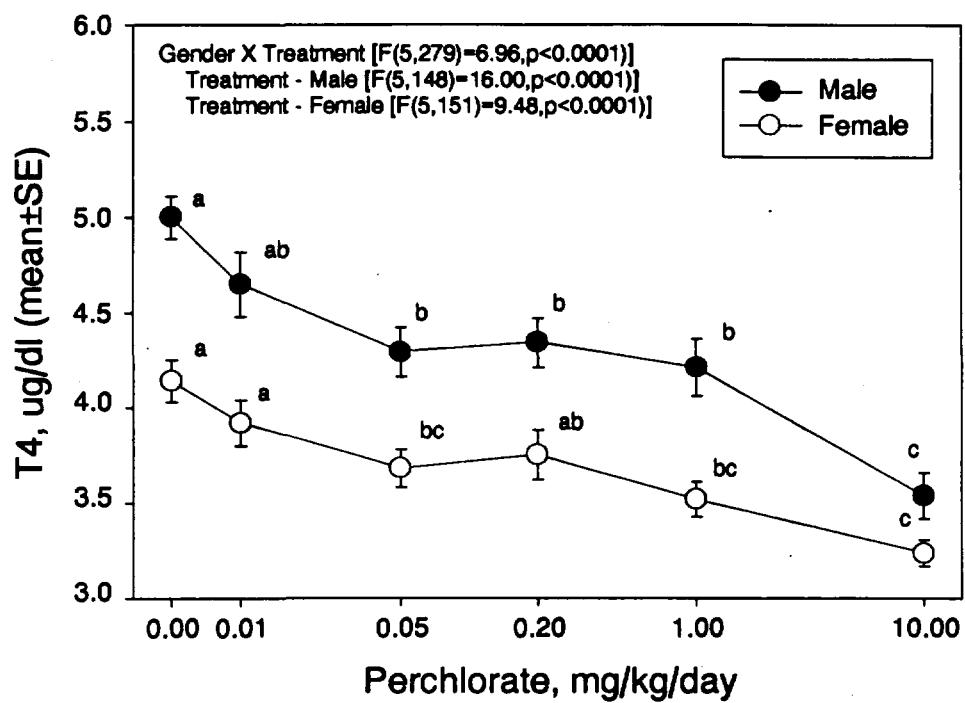


Figure 2. Effects of a 90-day exposure to perchlorate on serum total thyroxine(T4). There was a significant Gender-by-Treatment interaction, therefore, data was collapsed across days. Means with different letters are significantly different ($p<0.05$, Tukey's after significant main effect).

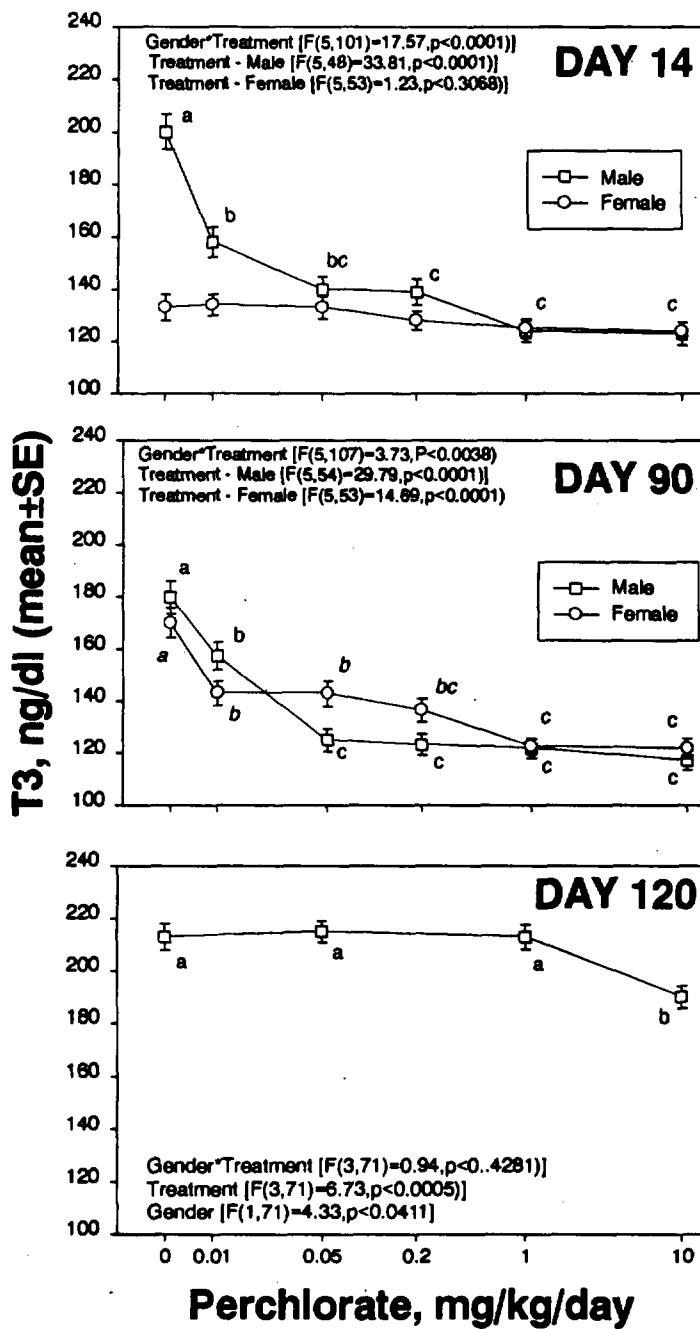


Figure 3. Effects of 90-day exposure to perchlorate on serum total triiodothyronine (T3) concentrations. There was a significant Day*Gender*Treatment interaction [$F(8,279)=6.72, p<0.0001$], and significant Gender*Treatment interactions for Day 14 and 90, but not 120. Therefore data were plotted by gender for Day 14 and 90, and collapsed across gender and plotted by dose for Day 120. Means with different letters were significantly different ($p<0.05$, Tukey's after significant main effect). The 120-day time-point is 30 days after cessation of exposure.

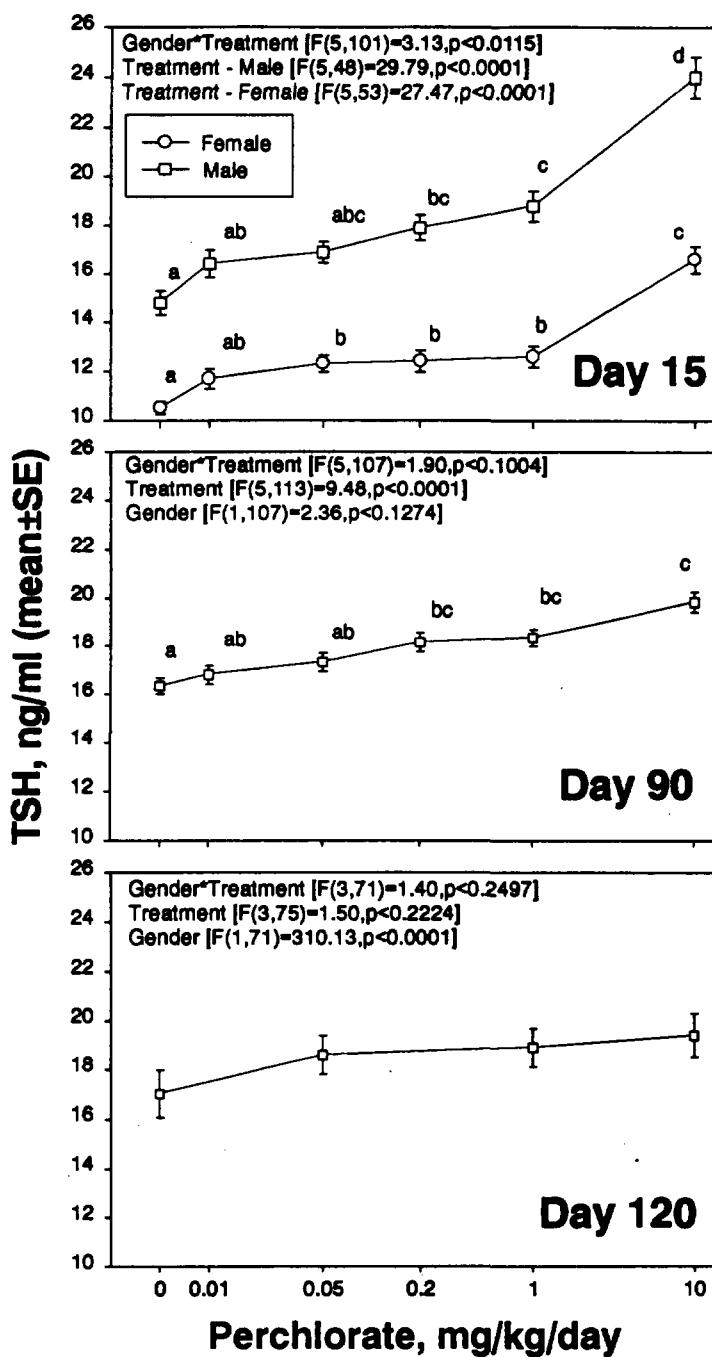


Figure 4. Effects of 90-day exposure to perchlorate on serum total thyroid stimulating hormone (TSH). There was a significant Day*Gender*Treatment interaction [$F(8,279)=2.83, p<0.0049$], and a main Gender*Treatment interaction for Day 1, but not Days 90 and 120. Therefore, data are presented separately for males and females on Day 14, and collapsed across Gender for Days 90 and 120. Means with different letters were significantly different ($p<0.05$, Tukey's after significant main effect). The 120-day time-point is 30 days after cessation of exposure.

APPENDIX 1 - Changes to Submitted Dataset

This documents changes made in the original data set. During review of the data by Agency personnel it was noticed that a number of animal ids were duplicated. These problems were resolved during conversations with Dr. David Mattie, WPAFB in a series of phone calls during the month of October, 1998.

Data from Excel Spreadsheet supplied by Dave Mattie

These data were all observed to be duplicates of other data AND the gender or treatment did not match the original values found in Appendix F

Observation	Animal	Sex	Dose	Age	T4	T3	TSH	Problem	Animal is Listed in Appendix E as:
1	11784	F	3	17	4.86	111.65	13.98	duplicate	MALE
2	11768	F	3	17	4.03	130.3	11.33	duplicate	MALE
3	11798	M	3	16	5.21	157.43	17.67	duplicate	listed as dose group 4
4	11804	F	4	17	4.41	109.23	14.15	duplicate	MALE
5	11801	F	4	17	5.02	112.29	13.46	duplicate	MALE
6	11970	M	4	18	5.05	150.73	18.8	duplicate	FEMALE
7	11846	F	6	17	3.59	131.1	17.43	duplicate	MALE
8	11858	F	6	17	3.4	112.99	17.88	duplicate	MALE

Disposition in Final Data Set

1	11941	F	3	17	4.86	111.65	13.98
2	11942	F	3	17	4.03	130.3	11.33
3	11798	M	4	16	5.21	157.43	17.67
4	11962	F	4	17	4.41	109.23	14.15
5	11960	F	4	17	5.02	112.29	13.46
6	11976	M	4	18	5.05	150.73	18.8
7	12013	F	6	17	3.59	131.1	17.43
8	12030	F	6	17	3.4	112.99	17.88

APPENDIX 2 - SAS Output Files

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The SAS System

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NOTE: Copyright (c) 1989-1996 by SAS Institute Inc., Cary, NC, USA.
 NOTE: SAS (r) Proprietary Software Release 6.12 TS020
 Licensed to US ENVIRONMENTAL PROTECTION AGENCY, Site 0019614059.
 NOTE: Running on ALPHASERVER Model 2100 5/300 Serial Number 80000000.

Welcome to the NHEERL-RTP SAS Information Delivery System.

```

1      *THIS FILE IS FOUND AT [CROFTON.THYROID]perchlorate_90day.SAS;
2      *IT ANALYZES THE.THYROID HORMONE DATA FROM THE WPAFB 90 DAY PERCHLORATE STUDY;
3
4
5      *INPUT DATA INTO SAS DATASET;
6      DATA RAW; INFILE '[CROFTON.THYROID.PERCHLORATE]PERCHLORATE_SUBCHRONIC_TH.TXT';
7          INPUT ANIM SEX$ DAY$ DOSE$ STUDYDAY T4 T3 TSH;
8
9      *DEFINITIONS OF VARIABLES;
10     *      ANIM = ANIMAL ID;
11     *      DAY = RANGE OF DAYS-ON-STUDY;
12     *      TRT = TREATMENT CODE;
13     *      STUDYDAY = DAY OF SAMPLING;
14     *      T4 = THYROXINE, ug/dl;
15     *      T3 = TRIIODOTHYRONINE, ng/ml;
16     *      TSH = THYROID STIMULATING HORMONE, ng/ml;
17
18     *ASSIGN TREATMENTS TO DOSAGE CODES IN MG/KG/DAY;
19     IF DOSE = '1' THEN TRT = '1-CONTROL';
20     IF DOSE = '2' THEN TRT = '2----0.01';
21     IF DOSE = '3' THEN TRT = '3----0.05';
22     IF DOSE = '4' THEN TRT = '4----0.20';
23     IF DOSE = '5' THEN TRT = '5----1.00';
24     IF DOSE = '6' THEN TRT = '6---10.00';
25
26     *PRINT THE RAW DATA FILE:
27     PROC PRINT;
28
29
30     *SORT DATA BY DAY, TRT AND SEX -- THEN GET MEANS;
31
32

```

NOTE: The infile '[CROFTON.THYROID.PERCHLORATE]PERCHLORATE_SUBCHRONIC_TH.TXT' is:
 File=DSA21:[SAS\$USERS.CROFTON.THYROID.PERCHLORATE]PERCHLORATE_SUBCHRONIC_TH.TXT

NOTE: 320 records were read from the infile '[CROFTON.THYROID.PERCHLORATE]PERCHLORATE_SUBCHRONIC_TH.TXT'.
 The minimum record length was 58.
 The maximum record length was 60.
 NOTE: The data set WORK.RAW has 320 observations and 9 variables.

```

32     PROC SORT; BY DAY TRT SEX;
33
34     PROC MEANS N MEAN STDERR MIN MAX STD VAR CV; BY DAY TRT SEX;
35         VAR T3 T4 TSH;
36

```

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35
36

NOTE: The PROCEDURE MEANS printed pages 1-7.

36 PROC SORT; BY DAY TRT;
37

NOTE: Input data set is already sorted, no sorting done.

37 PROC MEANS N MEAN STDERR MIN MAX STD VAR CV; BY DAY TRT;
38 VAR T3 T4 TSH;
39
40

NOTE: The PROCEDURE MEANS printed pages 8-11.

40 PROC SORT; BY SEX TRT;

NOTE: The data set WORK.RAW has 320 observations and 9 variables.

41 PROC MEANS N MEAN STDERR MIN MAX STD VAR CV; BY SEX TRT;
42 VAR T3 T4 TSH;
43
44
45 *RUN THREE WAY ANOVA - DAY*SEX*TRT;
46

NOTE: The PROCEDURE MEANS printed pages 12-14.

46 PROC SORT; BY DAY SEX TRT;
47

NOTE: The data set WORK.RAW has 320 observations and 9 variables.

47 PROC GLM;
48 CLASSES DAY SEX TRT;
49 MODEL T3 T4 TSH = DAY|SEX|TRT;
50 TITLE1 "WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA";
51 TITLE2 "PROC GLM - DAY BY SEX BY TRT INTERACTIONS";
52
53 *RUN TWO WAY ANOVA - SEX*TRT - FOR EACH DAY - T3 AND TSH ONLY;
54

NOTE: The PROCEDURE GLM printed pages 15-18.

54 PROC SORT; BY DAY;
55

NOTE: Input data set is already sorted, no sorting done.

55 PROC GLM; BY DAY;
56 CLASSES SEX TRT;
57 MODEL T3 TSH = SEX|TRT;
58 TITLE1 "WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA";
59 TITLE2 "PROC GLM - STEPDOWN ANOVAS BY DAY - SEX BY TRT INTERACTIONS";
60
61

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NOTE: The PROCEDURE GLM printed pages 19-27.

```
61      PROC SORT; BY DAY SEX;  
62
```

NOTE: Input data set is already sorted, no sorting done.

```
62      PROC GLM; BY DAY SEX ;  
63          CLASSES SEX TRT;  
64          MODEL T3 TSH = TRT;  
65          MEANS TRT/TUKEY LINES;  
66          TITLE1 "WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA";  
67          TITLE2 "PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT";  
68          TITLE3 "           NOTE: T3 AND TSH DATA ONLY           ";  
69  
70      *ANALYSIS FOR T3 DATA - DAY 120 ONLY;
```

NOTE: The PROCEDURE GLM printed pages 28-57.

```
71      DATA RAW2; SET RAW;  
72          IF STUDYDAY LT 100 THEN DELETE;  
73  
74
```

NOTE: The data set WORK.RAW2 has 79 observations and 9 variables.

```
74      PROC SORT; BY DAY;  
75
```

NOTE: The data set WORK.RAW2 has 79 observations and 9 variables.

```
75      PROC GLM; BY DAY;  
76          CLASSES TRT;  
77          MODEL T3 = TRT;  
78          MEANS TRT/TUKEY LINES;  
79          TITLE1 "WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA";  
80          TITLE2 "PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT";  
81          TITLE3 "           NOTE: T3 DATA FOR DAY 120 ONLY           ";  
82  
83      *ANALYSIS FOR TSH DATA - DAY 90 and 120 ONLY;
```

NOTE: The PROCEDURE GLM printed pages 58-60.

```
84      DATA RAW2; SET RAW;  
85          IF STUDYDAY LT 50 THEN DELETE;  
86  
87
```

NOTE: The data set WORK.RAW2 has 199 observations and 9 variables.

```
87      PROC SORT; BY DAY;  
88
```

NOTE: The data set WORK.RAW2 has 199 observations and 9 variables.

```
88      PROC GLM; BY DAY;  
89          CLASSES TRT;
```

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```
90      MODEL TSH = TRT;  
91      MEANS TRT/TUKEY LINES;  
92      TITLE1 "WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA";  
93      TITLE2 "PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT";  
94      TITLE3 "      NOTE: TSH DATA FOR DAY 90 or 120 ONLY      ";  
95  
96  
97      *ANOVA ANALYSES FOR T4 DATA;
```

NOTE: The PROCEDURE GLM printed pages 61-66.

```
98      DATA RAW3; SET RAW;  
99  
100;
```

NOTE: The data set WORK.RAW3 has 320 observations and 9 variables.

```
100      PROC SORT; BY DAY;  
101
```

NOTE: The data set WORK.BAW3 has 330 observations and 8 variables.

101 PROC GLM; BY DAY;
102

NOTE: The PROCEDURE GIM printed pages 67-75

109 PROC SORT; BY SEX;
110

NOTE: The data set WORK.BAW3 has 320 observations and 9 variables.

```
110 PROC GLM; BY SEX;  
111     CLASSES TRT;  
112     MODEL T4 = TRT;  
113     MEANS TRT/TUKEY LINES;  
114     TITLE1 "WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA";  
115     TITLE2 "PROC GLM - STEPDOWN ANOVAS BY SEX - MAIN EFFECT OF TREATMENT";  
116     TITLE3 "NOTE: T4 DATA ONLY";
```

NOTE: The PROCEDURE GUM printed pages 76-81

NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414

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----- DAY=15-18 TRT=1-CONTROL SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	132.9950000	4.7535812	113.0100000	155.2800000	15.0321435	225.9653389	11.3027885
T4	10	4.4880000	0.1366000	3.4700000	4.8900000	0.4319671	0.1865956	9.6249349
TSH	10	10.4400000	0.2493503	9.0000000	11.3600000	0.7885148	0.6217556	7.5528235

----- DAY=15-18 TRT=1-CONTROL SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	200.0120000	6.4033508	170.1600000	234.2100000	20.2491733	410.0290178	10.1239792
T4	10	5.6440000	0.1853837	4.8400000	6.6400000	0.5862347	0.3436711	10.3868655
TSH	10	14.7920000	0.4757866	13.0800000	17.4500000	1.5045693	2.2637289	10.1715071

----- DAY=15-18 TRT=2----0.01 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	134.0340000	3.8228350	113.0000000	147.2400000	12.0888656	146.1406711	9.0192530
T4	10	4.3230000	0.1432562	3.2400000	4.7400000	0.4530158	0.2052233	10.4792001
TSH	10	11.7180000	0.3847100	10.0300000	13.7100000	1.2165598	1.4800178	10.3819748

----- DAY=15-18 TRT=2----0.01 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	5	163.6260000	8.2184236	136.3000000	183.3000000	18.3769538	337.7124300	11.2310719
T4	5	5.2540000	0.3062123	4.2300000	6.0300000	0.6847116	0.4688300	13.0321968
TSH	5	16.1020000	0.9939588	12.7600000	18.4100000	2.2225593	4.9397700	13.8030017

----- DAY=15-18 TRT=3----0.05 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	132.7520000	4.0286581	111.6500000	147.8200000	12.7397356	162.3008622	9.5966430
T4	10	4.2550000	0.1250889	3.5100000	4.8600000	0.3955657	0.1564722	9.2964912
TSH	10	12.3390000	0.3219125	11.1000000	13.9800000	1.0179768	1.0362767	8.2500750

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----- DAY=15-18 TRT=3----0.05 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	9	138.0400000	4.9108910	119.8800000	167.3300000	14.7326729	217.0516500	10.6727564
T4	9	5.2133333	0.1019531	4.6500000	5.5800000	0.3058594	0.0935500	5.8668691
TSH	9	16.8388889	0.4562055	14.8900000	19.6300000	1.3686165	1.8731111	8.1277126

----- DAY=15-18 TRT=4----0.20 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	9	127.7766667	3.7796836	109.2300000	140.5400000	11.3390509	128.5740750	8.8741170
T4	9	4.1811111	0.1617564	3.3200000	5.0200000	0.4852691	0.2354861	11.6062238
TSH	9	12.3688889	0.4395055	10.5600000	14.1500000	1.3185166	1.7384861	10.6599440

----- DAY=15-18 TRT=4----0.20 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	141.1970000	4.9727401	120.1100000	172.3900000	15.7251051	247.2814456	11.1370532
T4	10	5.1570000	0.1215552	4.3600000	5.5900000	0.3843913	0.1477567	7.4537773
TSH	10	17.9660000	0.4869136	15.4500000	20.0300000	1.5397561	2.3708489	8.5703891

----- DAY=15-18 TRT=5----1.00 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	125.1170000	3.5160853	108.5000000	139.9500000	11.1188379	123.6285567	8.8867523
T4	10	4.1040000	0.1238655	3.4500000	4.6100000	0.3916972	0.1534267	9.5442778
TSH	10	12.5890000	0.3938033	10.1300000	14.9100000	1.2453152	1.5508100	9.8920901

----- DAY=15-18 TRT=5----1.00 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	123.7570000	3.9368462	101.6100000	139.5600000	12.4494007	154.9875789	10.0595528
T4	10	5.1910000	0.1457963	4.6900000	6.0600000	0.4610483	0.2125656	8.8816860
TSH	10	18.8000000	0.5836057	16.1100000	21.7500000	1.8455231	3.4059556	9.8166123

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----- DAY=15-18 TRT=6---10.00 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	124.4310000	3.0984643	109.0300000	137.8000000	9.7982044	96.0048100	7.8744078
T4	10	3.6390000	0.1104783	3.0900000	4.1600000	0.3493629	0.1220544	9.6005197
TSH	10	16.5610000	0.5350378	14.0000000	19.3700000	1.6919381	2.8626544	10.2164004

----- DAY=15-18 TRT=6---10.00 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	122.9160000	4.0195009	105.5900000	146.4300000	12.7107778	161.5638711	10.3410278
T4	10	4.3110000	0.1226236	3.7900000	4.7800000	0.3877700	0.1503656	8.9948963
TSH	10	24.0370000	0.7727915	20.4300000	27.8000000	2.4437815	5.9720678	10.1667490

----- DAY=92-95 TRT=1-CONTROL SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	170.0790000	5.6886936	148.7200000	208.4100000	17.9892285	323.6123433	10.5769840
T4	10	4.4410000	0.1381822	3.7300000	5.2800000	0.4369706	0.1909433	9.8394648
TSH	10	16.4790000	0.4689739	13.6500000	19.1400000	1.4830258	2.1993656	8.9994891

----- DAY=92-95 TRT=1-CONTROL SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	179.8370000	6.1606986	156.8900000	215.3300000	19.4818394	379.5420678	10.8330541
T4	10	5.0600000	0.1722466	4.3700000	6.3500000	0.5446916	0.2966889	10.7646552
TSH	10	16.1870000	0.4774982	14.3800000	18.6100000	1.5099820	2.2800456	9.3283621

----- DAY=92-95 TRT=2---0.01 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	143.1310000	4.7266341	122.9000000	163.7800000	14.9469294	223.4106989	10.4428317
T4	10	3.5210000	0.1067026	3.1000000	4.2900000	0.3374232	0.1138544	9.5831651
TSH	10	16.7830000	0.5782657	14.4500000	19.7600000	1.8286367	3.3439122	10.8957678

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----- DAY=92-95 TRT=2----0.01 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	157.4640000	5.2270374	136.1900000	186.8600000	16.5293437	273.2192044	10.4972208
T4	10	4.3560000	0.1474012	3.2200000	4.7900000	0.4661235	0.2172711	10.7007230
TSH	10	16.8410000	0.5519671	14.9600000	20.1400000	1.7454732	3.0466767	10.3644272

----- DAY=92-95 TRT=3----0.05 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	142.9010000	4.9427946	110.7900000	162.5900000	15.6304890	244.3121878	10.9379844
T4	10	3.3950000	0.1173149	3.0300000	4.1500000	0.3709822	0.1376278	10.9273102
TSH	10	16.8450000	0.5297762	15.1300000	19.7800000	1.6752993	2.8066278	9.9453803

----- DAY=92-95 TRT=3----0.05 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	125.0370000	4.3365337	107.6300000	157.1400000	13.7133237	188.0552456	10.9674126
T4	10	3.6320000	0.1130467	3.1600000	4.0600000	0.3574850	0.1277956	9.8426498
TSH	10	17.8340000	0.5174622	15.4100000	20.4500000	1.6363591	2.6776711	9.1755024

----- DAY=92-95 TRT=4----0.20 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	136.5120000	4.6184776	113.0700000	154.3500000	14.6049085	213.3033511	10.6986261
T4	10	3.3870000	0.1038380	3.1000000	4.1900000	0.3283646	0.1078233	9.6948519
TSH	10	17.3790000	0.4902209	15.2600000	19.9500000	1.5502147	2.4031656	8.9200453

----- DAY=92-95 TRT=4----0.20 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	123.2090000	4.1143990	103.6800000	144.3600000	13.0108719	169.2827878	10.5600012
T4	10	3.4950000	0.1144965	2.9200000	4.0500000	0.3620697	0.1310944	10.3596472
TSH	10	18.9700000	0.5471685	16.2400000	21.2900000	1.7302986	2.9939333	9.1212368

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----- DAY=92-95 TRT=5----1.00 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	9	122.5211111	3.1470619	107.7300000	137.1900000	9.4411856	89.1359861	7.7057623
T4	9	3.1833333	0.1025643	2.7900000	3.7800000	0.3076930	0.0946750	9.6657496
TSH	9	17.6266667	0.5265744	14.9700000	19.2000000	1.5797231	2.4955250	8.9621203

----- DAY=92-95 TRT=5----1.00 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	121.7920000	3.7168971	103.3300000	138.6900000	11.7538606	138.1532400	9.6507658
T4	10	3.4670000	0.1115751	2.7900000	3.8700000	0.3528314	0.1244900	10.1768504
TSH	10	19.0400000	0.4326199	17.3100000	21.5200000	1.3680643	1.8716000	7.1852118

----- DAY=92-95 TRT=6---10.00 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	121.8290000	3.8832782	100.5400000	137.5500000	12.2800040	150.7984989	10.0797052
T4	10	2.9910000	0.0861839	2.5000000	3.4900000	0.2725375	0.0742767	9.1119177
TSH	10	20.0300000	0.5333625	16.9300000	22.5900000	1.6866403	2.8447556	8.4205707

----- DAY=92-95 TRT=6---10.00 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	117.1470000	3.8153576	104.2600000	147.5400000	12.0652200	145.5695344	10.2992138
T4	10	2.8850000	0.0938586	2.5700000	3.5300000	0.2968071	0.0880944	10.2879405
TSH	10	19.0570000	0.6218379	16.1900000	22.8200000	1.9664240	3.8668233	10.3186440

----- DAY=97-123 TRT=1-CONTROL SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	223.7220000	6.7215778	201.6800000	269.3300000	21.2554954	451.7960844	9.5008517
T4	10	3.4890000	0.1025503	2.9300000	4.0200000	0.3242924	0.1051656	9.2947089
TSH	10	13.0760000	0.4194949	11.2100000	15.4400000	1.3265595	1.7597600	10.1449943

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----- DAY=97-123 TRT=1-CONTROL SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	203.4200000	6.4991584	174.5100000	238.2800000	20.5521434	422.3906000	10.1033052
T4	10	4.9500000	0.1501851	3.7000000	5.3900000	0.4749269	0.2255556	9.5944827
TSH	10	20.9280000	0.5031408	19.1100000	23.4700000	1.5910709	2.5315067	7.6025942

----- DAY=97-123 TRT=3---0.05 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	9	215.9966667	5.7356134	203.4000000	258.5500000	17.2068402	296.0753500	7.9662527
T4	9	3.3588889	0.1209734	2.9400000	3.8800000	0.3629203	0.1317111	10.8047711
TSH	9	15.6433333	0.5634714	13.9400000	18.3900000	1.6904142	2.8575000	10.8059716

----- DAY=97-123 TRT=3---0.05 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	214.1870000	6.0897143	198.5700000	265.2800000	19.2573675	370.8462011	8.9909133
T4	10	4.0430000	0.1205271	3.3900000	4.6400000	0.3811401	0.1452678	9.4271606
TSH	10	21.3300000	0.5880363	17.6600000	24.1200000	1.8595340	3.4578667	8.7179278

----- DAY=97-123 TRT=5---1.00 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	214.6620000	6.3411045	180.6200000	246.4000000	20.0523331	402.0960622	9.3413520
T4	10	3.2590000	0.0970618	2.7700000	3.8300000	0.3069365	0.0942100	9.4181183
TSH	10	15.7530000	0.4541978	12.3500000	17.8400000	1.4362996	2.0629567	9.1176261

----- DAY=97-123 TRT=5---1.00 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	211.6040000	7.1784397	183.5600000	254.4800000	22.7002194	515.2999600	10.7276892
T4	10	3.9880000	0.0911385	3.5100000	4.3900000	0.2882052	0.0830622	7.2268098
TSH	10	22.1520000	0.4601130	19.3900000	24.2000000	1.4550052	2.1170400	6.5682790

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----- DAY=97-123 TRT=6---10.00 SEX=F -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	197.1240000	6.6229304	167.8000000	230.2900000	20.9435449	438.6320711	10.6245535
T4	10	3.0950000	0.1065233	2.7100000	3.8100000	0.3368564	0.1134722	10.8838896
TSH	10	16.0210000	0.4554325	14.0300000	18.2400000	1.4402041	2.0741878	8.9894768

----- DAY=97-123 TRT=6---10.00 SEX=M -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	10	184.6270000	5.2191010	163.5600000	219.2800000	16.5042466	272.3901567	8.9392378
T4	10	3.4320000	0.0983621	2.7600000	3.8100000	0.3110484	0.0967511	9.0631820
TSH	10	22.7880000	0.7703546	20.1000000	28.1200000	2.4360752	5.9344622	10.6901666

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----- DAY=15-18 TRT=1-CONTROL -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	166.5035000	8.6115499	113.0100000	234.2100000	38.5120218	1483.18	23.1298572
T4	20	5.0660000	0.1736154	3.4700000	6.6400000	0.7764318	0.6028463	15.3263282
TSH	20	12.6160000	0.5635155	9.0000000	17.4500000	2.5201178	6.3509937	19.9755691

----- DAY=15-18 TRT=2----0.01 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	15	143.8980000	5.1570897	113.0000000	183.3000000	19.9733226	398.9336171	13.8801947
T4	15	4.6333333	0.1774359	3.2400000	6.0300000	0.6872062	0.4722524	14.8317888
TSH	15	13.1793333	0.6801404	10.0300000	18.4100000	2.6341723	6.9388638	19.9871439

----- DAY=15-18 TRT=3----0.05 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	19	135.2568421	3.1201932	111.6500000	167.3300000	13.6006066	184.9765006	10.0553927
T4	19	4.7089474	0.1379357	3.5100000	5.5800000	0.6012477	0.3614988	12.7681981
TSH	19	14.4705263	0.5929106	11.1000000	19.6300000	2.5844373	6.6793164	17.8600093

----- DAY=15-18 TRT=4----0.20 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	19	134.8400000	3.4654756	109.2300000	172.3900000	15.1056579	228.1809000	11.2026534
T4	19	4.6947368	0.1502909	3.3200000	5.5900000	0.6551028	0.4291596	13.9539829
TSH	19	15.3147368	0.7327743	10.5600000	20.0300000	3.1940889	10.2022041	20.8563096

----- DAY=15-18 TRT=5----1.00 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	124.4370000	2.5735462	101.6100000	139.9500000	11.5092485	132.4628011	9.2490566
T4	20	4.6475000	0.1556123	3.4500000	6.0600000	0.6959195	0.4843039	14.9740613
TSH	20	15.6945000	0.7905586	10.1300000	21.7500000	3.5354855	12.4996576	22.5269074

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--- DAY=15-18 TRT=6---10.00 ---

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	123.6735000	2.4759869	105.5900000	146.4300000	11.0729501	122.6102239	8.9533733
T4	20	3.9750000	0.1113281	3.0900000	4.7800000	0.4978744	0.2478789	12.5251429
TSH	20	20.2990000	0.9719289	14.0000000	27.8000000	4.3465981	18.8929147	21.4128679

--- DAY=92-95 TRT=1-CONTROL ---

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	174.9580000	4.2316112	148.7200000	215.3300000	18.9243404	358.1306589	10.8165048
T4	20	4.7505000	0.1288052	3.7300000	6.3500000	0.5760343	0.3318155	12.1257617
TSH	20	16.3330000	0.3274343	13.6500000	19.1400000	1.4643306	2.1442642	8.9654726

--- DAY=92-95 TRT=2---0.01 ---

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	150.2975000	3.8033377	122.9000000	186.8600000	17.0090434	289.3075566	11.3169170
T4	20	3.9385000	0.1304472	3.1000000	4.7900000	0.5833774	0.3403292	14.8121726
TSH	20	16.8120000	0.3891019	14.4500000	20.1400000	1.7401168	3.0280063	10.3504446

--- DAY=92-95 TRT=3---0.05 ---

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	133.9690000	3.7999028	107.6300000	162.5900000	16.9936821	288.7852305	12.6847868
T4	20	3.5135000	0.0838177	3.0300000	4.1500000	0.3748442	0.1405082	10.6686830
TSH	20	17.3395000	0.3778377	15.1300000	20.4500000	1.6897414	2.8552261	9.7450412

--- DAY=92-95 TRT=4---0.20 ---

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	129.8605000	3.3748779	103.6800000	154.3500000	15.0929128	227.7960155	11.6224046
T4	20	3.4410000	0.0762368	2.9200000	4.1900000	0.3409414	0.1162411	9.9082075
TSH	20	18.1745000	0.4014129	15.2600000	21.2900000	1.7951733	3.2226471	9.8774287

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----- DAY=92-95 TRT=5----1.00 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	19	122.1373684	2.3933296	103.3300000	138.6900000	10.4322821	108.8325094	8.5414335
T4	19	3.3326316	0.0812722	2.7900000	3.8700000	0.3542573	0.1254982	10.6299574
TSH	19	18.3705263	0.3678231	14.9700000	21.5200000	1.6033038	2.5705830	8.7275877

----- DAY=92-95 TRT=6---10.00 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	119.4880000	2.7032719	100.5400000	147.5400000	12.0893993	146.1535747	10.1176681
T4	20	2.9380000	0.0631939	2.5000000	3.5300000	0.2826119	0.0798695	9.6191926
TSH	20	19.5435000	0.4140234	16.1900000	22.8200000	1.8515691	3.4283082	9.4740917

----- DAY=97-123 TRT=1-CONTROL -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	213.5710000	5.1115288	174.5100000	269.3300000	22.8594518	522.5545358	10.7034437
T4	20	4.2195000	0.1895222	2.9300000	5.3900000	0.8475691	0.7183734	20.0869564
TSH	20	17.0020000	0.9554427	11.2100000	23.4700000	4.2728699	18.2574168	25.1315719

----- DAY=97-123 TRT=3---0.05 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	19	215.0442105	4.0902577	198.5700000	265.2800000	17.8290201	317.8739591	8.2908627
T4	19	3.7189474	0.1156975	2.9400000	4.6400000	0.5043136	0.2543322	13.5606532
TSH	19	18.6363158	0.7782903	13.9400000	24.1200000	3.3924888	11.5089801	18.2036451

----- DAY=97-123 TRT=5----1.00 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	213.1330000	4.6744887	180.6200000	254.4800000	20.9049491	437.0168958	9.8084056
T4	20	3.6235000	0.1057885	2.7700000	4.3900000	0.4731004	0.2238239	13.0564470
TSH	20	18.9525000	0.7986106	12.3500000	24.2000000	3.5714952	12.7555776	18.8444540

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----- DAY=97-123 TRT=6---10.00 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	190.8755000	4.3468304	163.5600000	230.2900000	19.4396165	377.8986892	10.1844482
T4	20	3.2635000	0.0804568	2.7100000	3.8100000	0.3598139	0.1294661	11.0253995
TSH	20	19.4045000	0.8900610	14.0300000	28.1200000	3.9804740	15.8441734	20.5131491

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----- SEX=F TRT=1-CONTROL -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	30	175.5986667	7.6283129	113.0100000	269.3300000	41.7819906	1745.73	23.7940250
T4	30	4.1393333	0.1108970	2.9300000	5.2800000	0.6074079	0.3689444	14.6740516
TSH	30	13.3316667	0.5080456	9.0000000	19.1400000	2.7826805	7.7433109	20.8727130

----- SEX=F TRT=2---0.01 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	138.5825000	3.1371037	113.0000000	163.7800000	14.0295541	196.8283882	10.1236116
T4	20	3.9220000	0.1265714	3.1000000	4.7400000	0.5660444	0.3204063	14.4325458
TSH	20	14.2505000	0.6721656	10.0300000	19.7600000	3.0060159	9.0361313	21.0941080

----- SEX=F TRT=3---0.05 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	29	162.0862069	7.4004758	110.7900000	258.5500000	39.8527817	1588.24	24.5873986
T4	29	3.6803448	0.1037896	2.9400000	4.8600000	0.5589242	0.3123963	15.1867356
TSH	29	14.9182759	0.4519073	11.1000000	19.7800000	2.4335953	5.9223862	16.3128457

----- SEX=F TRT=4---0.20 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	19	132.3742105	3.1108998	109.2300000	154.3500000	13.5600976	183.8762480	10.2437609
T4	19	3.7631579	0.1306910	3.1000000	5.0200000	0.5696690	0.3245228	15.1380582
TSH	19	15.0057895	0.6719894	10.5600000	19.9500000	2.9291340	8.5798257	19.5200257

----- SEX=F TRT=5---1.00 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	29	155.1889655	8.5574671	107.7300000	246.4000000	46.0833706	2123.68	29.6950047
T4	29	3.5268966	0.0998559	2.7700000	4.6100000	0.5377407	0.2891650	15.2468511
TSH	29	15.2434483	0.4664390	10.1300000	19.2000000	2.5118509	6.3093948	16.4782327

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----- SEX=F TRT=6---10.00 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	30	147.7946667	7.0060333	100.5400000	230.2900000	38.3736248	1472.54	25.9641472
T4	30	3.2416667	0.0773885	2.5000000	4.1600000	0.4238744	0.1796695	13.0758182
TSH	30	17.5373333	0.4350891	14.0000000	22.5900000	2.3830811	5.6790754	13.5886171

----- SEX=M TRT=1-CONTROL -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	30	194.4230000	4.0339078	156.8900000	238.2800000	22.0946229	488.1723597	11.3642022
T4	30	5.2180000	0.1102551	3.7000000	6.6400000	0.6038920	0.3646855	11.5732460
TSH	30	17.3023333	0.5576939	13.0800000	23.4700000	3.0546151	9.3306737	17.6543538

----- SEX=M TRT=2---0.01 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	15	159.5180000	4.3295167	136.1900000	186.8600000	16.7681459	281.1707171	10.5117579
T4	15	4.6553333	0.1761868	3.2200000	6.0300000	0.6823684	0.4656267	14.6577780
TSH	15	16.5946667	0.4830438	12.7600000	20.1400000	1.8708205	3.4999695	11.2736254

----- SEX=M TRT=3---0.05 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	29	159.8137931	8.0555429	107.6300000	265.2800000	43.3804262	1881.86	27.1443568
T4	29	4.2644828	0.1394911	3.1600000	5.5800000	0.7511828	0.5642756	17.6148634
TSH	29	18.7306897	0.4682264	14.8900000	24.1200000	2.5214762	6.3578424	13.4617373

----- SEX=M TRT=4---0.20 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	20	132.2030000	3.7581206	103.6800000	172.3900000	16.8068263	282.4694116	12.7128933
T4	20	4.3260000	0.2072431	2.9200000	5.5900000	0.9268191	0.8589937	21.4243902
TSH	20	18.4680000	0.3745985	15.4500000	21.2900000	1.6752552	2.8064800	9.0711241

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----- SEX=M TRT=5----1.00 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	30	152.3843333	8.2976113	101.6100000	254.4800000	45.4478887	2065.51	29.8245152
T4	30	4.2153333	0.1493940	2.7900000	6.0600000	0.8182645	0.6695568	19.4116201
TSH	30	19.9973333	0.3960700	16.1100000	24.2000000	2.1693650	4.7061444	10.8482713

----- SEX=M TRT=6---10.00 -----

Variable	N	Mean	Std Error	Minimum	Maximum	Std Dev	Variance	CV
T3	30	141.5633333	6.1773883	104.2600000	219.2800000	33.8349491	1144.80	23.9009271
T4	30	3.5426667	0.1239577	2.5700000	4.7800000	0.6789441	0.4609651	19.1647744
TSH	30	21.9606667	0.5634759	16.1900000	28.1200000	3.0862844	9.5251513	14.0536917

1

WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 15
PROC GLM - DAY BY SEX BY TRT INTERACTIONS

General Linear Models Procedure
Class Level Information

Class	Levels	Values
DAY	3	15-18 92-95 97-123
SEX	2	F M
TRT	6	1-CONTROL 2----0.01 3----0.05 4----0.20 5----1.00 6---10.00

Number of observations in data set = 320

NOTE: All dependent variable are consistent with respect to the presence or absence of missing values. However only 311 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 16
 PROC GLM - DAY BY SEX BY TRT INTERACTIONS

General Linear Models Procedure

Dependent Variable: T3

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	31	397088.59550323	12809.30953236	50.58	0.0001
Error	279	70653.05823889	253.23676788		
Corrected Total	310	467741.65374212			

R-Square	C.V.	Root MSE	T3 Mean
0.848949	10.20173	15.91341471	155.98742765

Source	DF	Type I SS	Mean Square	F Value	Pr > F
DAY	2	287279.69504049	143639.84752024	567.22	0.0001
SEX	1	728.64136609	728.64136609	2.88	0.0910
DAY*SEX	2	9771.76633045	4885.88316523	19.29	0.0001
TRT	5	59458.58565945	11891.71713189	46.96	0.0001
DAY*TRT	8	17666.10503950	2208.26312994	8.72	0.0001
SEX*TRT	5	8578.11167274	1715.62233455	6.77	0.0001
DAY*SEX*TRT	8	13605.69039451	1700.71129931	6.72	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
DAY	2	262165.53843281	131082.76921640	517.63	0.0001
SEX	1	669.49926807	669.49926807	2.64	0.1051
DAY*SEX	2	9700.30326273	4850.15163136	19.15	0.0001
TRT	5	59719.92649166	11943.98529833	47.17	0.0001
DAY*TRT	8	17576.45109405	2197.05638676	8.68	0.0001
SEX*TRT	5	8331.93875094	1666.38775019	6.58	0.0001
DAY*SEX*TRT	8	13605.69039451	1700.71129931	6.72	0.0001

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 17
 PROC GLM - DAY BY SEX BY TRT INTERACTIONS

General Linear Models Procedure

Dependent Variable: T4

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	31	174.13998460	5.61741886	35.88	0.0001
Error	279	43.68287778	0.15656945		
Corrected Total	310	217.82286238			
		R-Square	C.V.	Root MSE	T4 Mean
		0.799457	9.847253	0.39568858	4.01826367
Source	DF	Type I SS	Mean Square	F Value	Pr > F
DAY	2	64.16435426	32.08217713	204.91	0.0001
SEX	1	35.24399788	35.24399788	225.10	0.0001
DAY*SEX	2	6.12743338	3.06371669	19.57	0.0001
TRT	5	53.05916292	10.61183258	67.78	0.0001
DAY*TRT	8	8.56640227	1.07080028	6.84	0.0001
SEX*TRT	5	5.44868945	1.08973789	6.96	0.0001
DAY*SEX*TRT	8	1.52994443	0.19124305	1.22	0.2862
Source	DF	Type III SS	Mean Square	F Value	Pr > F
DAY	2	65.48340703	32.74170352	209.12	0.0001
SEX	1	35.55913190	35.55913190	227.11	0.0001
DAY*SEX	2	6.18243160	3.09121580	19.74	0.0001
TRT	5	52.73947675	10.54789535	67.37	0.0001
DAY*TRT	8	8.55577646	1.06947206	6.83	0.0001
SEX*TRT	5	5.17879615	1.03575923	6.62	0.0001
DAY*SEX*TRT	8	1.52994443	0.19124305	1.22	0.2862

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 18
 PROC GLM - DAY BY SEX BY TRT INTERACTIONS

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	31	3278.97977968	105.77354128	39.99	0.0001
Error	279	738.00430778	2.64517673		
Corrected Total	310	4016.98408746			
	R-Square	C.V.	Root MSE		TSH Mean
	0.816279	9.525332	1.62639993		17.07446945
Source	DF	Type I SS	Mean Square	F Value	Pr > F
DAY	2	547.07071393	273.53535696	103.41	0.0001
SEX	1	1193.28183565	1193.28183565	451.12	0.0001
DAY*SEX	2	588.01100790	294.00550395	111.15	0.0001
TRT	5	669.82533488	133.96506698	50.65	0.0001
DAY*TRT	8	205.24477899	25.65559737	9.70	0.0001
SEX*TRT	5	15.56920639	3.11384128	1.18	0.3205
DAY*SEX*TRT	8	59.97690195	7.49711274	2.83	0.0049
Source	DF	Type III SS	Mean Square	F Value	Pr > F
DAY	2	458.77317430	229.38658715	86.72	0.0001
SEX	1	1217.12522653	1217.12522653	460.13	0.0001
DAY*SEX	2	530.63899533	265.31949766	100.30	0.0001
TRT	5	674.64311549	134.92862310	51.01	0.0001
DAY*TRT	8	207.61756608	25.95219576	9.81	0.0001
SEX*TRT	5	16.39269992	3.27853998	1.24	0.2908
DAY*SEX*TRT	8	59.97690195	7.49711274	2.83	0.0049

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 19
PROC GLM - STEPDOWN ANOVAS BY DAY - SEX BY TRT INTERACTIONS

----- DAY=15-18 -----

General Linear Models Procedure
Class Level Information

Class Levels Values

SEX 2 F M

TRT 6 1-CONTROL 2----0.01 3----0.05 4----0.20 5----1.00 6---10.00

Number of observations in by group = 120

NOTE: All dependent variable are consistent with respect to the presence or absence of missing values. However
only 113 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 20
 PROC GLM - STEPDOWN ANOVAS BY DAY - SEX BY TRT INTERACTIONS

----- DAY=15-18 -----

General Linear Models Procedure

Dependent Variable: T3

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	51268.06250292	4660.73295481	23.94	0.0001
Error	101	19666.97489000	194.72252366		
Corrected Total	112	70935.03739292			
		R-Square	C.V.	Root MSE	T3 Mean
		0.722747	10.11922	13.95430126	137.89902655
Source	DF	Type I SS	Mean Square	F Value	Pr > F
SEX	1	8612.08066238	8612.08066238	44.23	0.0001
TRT	5	25553.70598461	5110.74119692	26.25	0.0001
SEX*TRT	5	17102.27585593	3420.45517119	17.57	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
SEX	1	9562.14327134	9562.14327134	49.11	0.0001
TRT	5	25944.29890257	5188.85978051	26.65	0.0001
SEX*TRT	5	17102.27585593	3420.45517119	17.57	0.0001

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 21
 PROC GLM - STEPDOWN ANOVAS BY DAY - SEX BY TRT INTERACTIONS

----- DAY=15-18 -----

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	1602.51377479	145.68307044	60.62	0.0001
Error	101	242.72889778	2.40325641		
Corrected Total	112	1845.24267257			
		R-Square	C.V.	Root MSE	TSH Mean
		0.868457	10.09204	1.55024399	15.36106195

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SEX	1	891.16998685	891.16998685	370.82	0.0001
TRT	5	673.77298493	134.75459699	56.07	0.0001
SEX*TRT	5	37.57080301	7.51416060	3.13	0.0115
Source	DF	Type III SS	Mean Square	F Value	Pr > F
SEX	1	799.82803361	799.82803361	332.81	0.0001
TRT	5	679.18440435	135.83688087	56.52	0.0001
SEX*TRT	5	37.57080301	7.51416060	3.13	0.0115

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 22
PROC GLM - STEPDOWN ANOVAS BY DAY - SEX BY TRT INTERACTIONS

----- DAY=92-95 -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
SEX	2	F M
TRT	6	1-CONTROL 2----0.01 3----0.05 4----0.20 5----1.00 6---10.00

Number of observations in by group = 120

NOTE: All dependent variable are consistent with respect to the presence or absence of missing values. However
only 119 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 23
 PROC GLM - STEPDOWN ANOVAS BY DAY - SEX BY TRT INTERACTIONS

----- DAY=92-95 -----

General Linear Models Procedure

Dependent Variable: T3

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	47681.76890641	4334.70626422	20.38	0.0001
Error	107	22756.42032889	212.67682550		
Corrected Total	118	70438.18923529			
		R-Square	C.V.	Root MSE	T3 Mean
		0.676931	10.52281	14.58344354	138.58882353

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SEX	1	166.93407383	166.93407383	0.78	0.3776
TRT	5	43549.26769819	8709.85353964	40.95	0.0001
SEX*TRT	5	3965.56713439	793.11342688	3.73	0.0038
Source	DF	Type III SS	Mean Square	F Value	Pr > F
SEX	1	128.74784359	128.74784359	0.61	0.4383
TRT	5	43559.70417704	8711.94083541	40.96	0.0001
SEX*TRT	5	3965.56713439	793.11342688	3.73	0.0038

1

WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 24
 PROC GLM - STEPDOWN ANOVAS BY DAY - SEX BY TRT INTERACTIONS

----- DAY=92-95 -----

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	11	168.55748059	15.32340733	5.60	0.0001
Error	107	292.97539000	2.73808776		
Corrected Total	118	461.53287059			
		R-Square	C.V.	Root MSE	TSH Mean
		0.365212	9.318642	1.65471682	17.75705882
Source	DF	Type I SS	Mean Square	F Value	Pr > F
SEX	1	6.46361632	6.46361632	2.36	0.1274
TRT	5	136.09129453	27.21825891	9.94	0.0001
SEX*TRT	5	26.00256973	5.20051395	1.90	0.1004
Source	DF	Type III SS	Mean Square	F Value	Pr > F
SEX	1	6.41035606	6.41035606	2.34	0.1289
TRT	5	135.50899487	27.10179897	9.90	0.0001
SEX*TRT	5	26.00256973	5.20051395	1.90	0.1004

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 25
PROC GLM - STEPDOWN ANOVAS BY DAY - SEX BY TRT INTERACTIONS

----- DAY=97-123 -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
SEX	2	F M
TRT	4	1-CONTROL 3----0.05 5----1.00 6---10.00

Number of observations in by group = 80

NOTE: All dependent variable are consistent with respect to the presence or absence of missing values. However
only 79 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 26
 PROC GLM - STEPDOWN ANOVAS BY DAY - SEX BY TRT INTERACTIONS

----- DAY=97-123 -----

General Linear Models Procedure

Dependent Variable: T3

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	10859.06905342	1551.29557906	3.90	0.0012
Error	71	28229.66302000	397.60088761		
Corrected Total	78	39088.73207342			
		R-Square	C.V.	Root MSE	T3 Mean
		0.277806	9.583339	19.93993199	208.06873418

Source	DF	Type I SS	Mean Square	F Value	Pr > F
SEX	1	1721.39296034	1721.39296034	4.33	0.0411
TRT	3	8021.71701614	2673.90567205	6.73	0.0005
SEX*TRT	3	1115.95907693	371.98635898	0.94	0.4281
Source	DF	Type III SS	Mean Square	F Value	Pr > F
SEX	1	1749.17808219	1749.17808219	4.40	0.0395
TRT	3	7965.13526893	2655.04508964	6.68	0.0005
SEX*TRT	3	1115.95907693	371.98635898	0.94	0.4281

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 27
 PROC GLM - STEPDOWN ANOVAS BY DAY - SEX BY TRT INTERACTIONS

----- DAY=97-123 -----

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	960.83781038	137.26254434	48.17	0.0001
Error	71	202.30002000	2.84929606		
Corrected Total	78	1163.13783038			
	R-Square	C.V.	Root MSE		TSH Mean
	0.826074	9.125684	1.68798580		18.49708861
Source	DF	Type I SS	Mean Square	F Value	Pr > F
SEX	1	883.65924038	883.65924038	310.13	0.0001
TRT	3	65.20583440	21.73527813	7.63	0.0002
SEX*TRT	3	11.97273560	3.99091187	1.40	0.2497
Source	DF	Type III SS	Mean Square	F Value	Pr > F
SEX	1	879.21273918	879.21273918	308.57	0.0001
TRT	3	65.22139160	21.74046387	7.63	0.0002
SEX*TRT	3	11.97273560	3.99091187	1.40	0.2497

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 28
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=15-18 SEX=F -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
SEX	1	F
TRT	6	1-CONTROL 2----0.01 3----0.05 4----0.20 5----1.00 6---10.00

Number of observations in by group = 60

NOTE: All dependent variable are consistent with respect to the presence or absence of missing values. However only 59 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 29
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=15-18 SEX=F -----

General Linear Models Procedure

Dependent Variable: T3

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	909.12926017	181.82585203	1.23	0.3068
Error	53	7814.95475000	147.45197642		
Corrected Total	58	8724.08401017			

R-Square	C.V.	Root MSE	T3 Mean
0.104209	9.373408	12.14298054	129.54711864

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	909.12926017	181.82585203	1.23	0.3068
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	909.12926017	181.82585203	1.23	0.3068

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 30
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=15-18 SEX=F -----

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	212.16693535	42.43338707	27.47	0.0001
Error	53	81.87151889	1.54474564		
Corrected Total	58	294.03845424			
		R-Square	C.V.	Root MSE	TSH Mean
		0.721562	9.806202	1.24287797	12.67440678
Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	212.16693535	42.43338707	27.47	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	212.16693535	42.43338707	27.47	0.0001

1

WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 31
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=15-18 SEX=F -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T3

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 53 MSE= 147.452
Critical Value of Studentized Range= 4.181
Minimum Significant Difference= 16.203
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 9.818182

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	134.034	10	2----0.01
A	132.995	10	1-CONTROL
A	132.752	10	3----0.05
A	127.777	9	4----0.20
A	125.117	10	5----1.00
A	124.431	10	6---10.00

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 32
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=15-18 SEX=F -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: TSH

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 53 MSE= 1.544746
Critical Value of Studentized Range= 4.181
Minimum Significant Difference= 1.6585
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 9.818182

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	16.5610	10	6---10.00
B	12.5890	10	5----1.00
B	12.3689	9	4----0.20
B	12.3390	10	3----0.05
B	11.7180	10	2----0.01
C	10.4400	10	1-CONTROL

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 33
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=15-18 SEX=M -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
SEX	1	M
TRT	6	1-CONTROL 2----0.01 3----0.05 4----0.20 5----1.00 6---10.00

Number of observations in by group = 60

NOTE: All dependent variable are consistent with respect to the presence or absence of missing values. However
only 54 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 34
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=15-18 SEX=M -----

General Linear Models Procedure

Dependent Variable: T3

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	41746.85258037	8349.37051607	33.81	0.0001
Error	48	11852.02014000	246.91708625		
Corrected Total	53	53598.87272037			

R-Square	C.V.	Root MSE	T3 Mean
0.778876	10.68776	15.71359559	147.02425926

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	41746.85258037	8349.37051607	33.81	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	41746.85258037	8349.37051607	33.81	0.0001

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 35
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=15-18 SEX=M -----

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	499.17685259	99.83537052	29.79	0.0001
Error	48	160.85737889	3.35119539		
Corrected Total	53	660.03423148			
		R-Square	C.V.	Root MSE	TSH Mean
		0.756289	10.00535	1.83062705	18.29648148
Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	499.17685259	99.83537052	29.79	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	499.17685259	99.83537052	29.79	0.0001

1
WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 36
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=15-18 SEX=M -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T3

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 48 MSE= 246.9171
Critical Value of Studentized Range= 4.197
Minimum Significant Difference= 22.706
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 8.4375

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	200.012	10	1-CONTROL
B	163.626	5	2----0.01
B	141.197	10	4----0.20
C	138.040	9	3----0.05
C	123.757	10	5----1.00
C	122.916	10	6---10.00

1

WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 37
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=15-18 SEX=M -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: TSH

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 48 MSE= 3.351195
Critical Value of Studentized Range= 4.197
Minimum Significant Difference= 2.6452
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 8.4375

Means with the same letter are not significantly different.

Tukey Grouping		Mean	N	TRT
	A	24.0370	10	6---10.00
	B	18.8000	10	5----1.00
C	B	17.9660	10	4----0.20
C	B			
C	B	16.8389	9	3----0.05
C	D	16.1020	5	2----0.01
C	D			
	D	14.7920	10	1-CONTROL

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 38
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=92-95 SEX=F -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
SEX	1	F
TRT	6	1-CONTROL 2----0.01 3----0.05 4----0.20 5----1.00 6---10.00

Number of observations in by group = 60

NOTE: All dependent variable are consistent with respect to the presence or absence of missing values. However
only 59 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 39
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=92-95 SEX=F -----

General Linear Models Procedure

Dependent Variable: T3

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	15399.99727925	3079.99945585	14.69	0.0001
Error	53	11112.02160889	209.66078507		
Corrected Total	58	26512.01888813			

R-Square	C.V.	Root MSE	T3 Mean
0.580869	10.35866	14.47966799	139.78322034

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	15399.99727925	3079.99945585	14.69	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	15399.99727925	3079.99945585	14.69	0.0001

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 40
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=92-95 SEX=F -----

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	84.12671593	16.82534319	6.26	0.0001
Error	53	142.34464000	2.68574792		
Corrected Total	58	226.47135593			
		R-Square	C.V.	Root MSE	TSH Mean
		0.371467	9.352939	1.63882517	17.52203390

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	84.12671593	16.82534319	6.26	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	84.12671593	16.82534319	6.26	0.0001

1

WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 41
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=92-95 SEX=F -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T3

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 53 MSE= 209.6608
Critical Value of Studentized Range= 4.181
Minimum Significant Difference= 19.321
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 9.818182

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	170.079	10	1-CONTROL
B	143.131	10	2----0.01
B	142.901	10	3----0.05
B	136.512	10	4----0.20
C	122.521	9	5----1.00
C	121.829	10	6---10.00

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 42
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=92-95 SEX=F -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: TSH

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 53 MSE= 2.685748
Critical Value of Studentized Range= 4.181
Minimum Significant Difference= 2.1868
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 9.818182

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	20.0300	10	6---10.00
B	17.6267	9	5----1.00
B	17.3790	10	4----0.20
B	16.8450	10	3----0.05
B	16.7830	10	2----0.01
B	16.4790	10	1-CONTROL

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 43
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=92-95 SEX=M -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
SEX	1	M
TRT	6	1-CONTROL 2---0.01 3---0.05 4---0.20 5---1.00 6---10.00

Number of observations in by group = 60

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 44
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=92-95 SEX=M -----

General Linear Models Procedure

Dependent Variable: T3

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	32114.83755333	6422.96751067	29.79	0.0001
Error	54	11644.39872000	215.63701333		
Corrected Total	59	43759.23627333			
		R-Square	C.V.	Root MSE	T3 Mean
		0.733898	10.68636	14.68458421	137.41433333

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	32114.83755333	6422.96751067	29.79	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	32114.83755333	6422.96751067	29.79	0.0001

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 45
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=92-95 SEX=M -----

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	77.96714833	15.59342967	5.59	0.0003
Error	54	150.63075000	2.78945833		
Corrected Total	59	228.59789833			

R-Square	C.V.	Root MSE	TSH Mean
0.341067	9.284810	1.67016716	17.98816667

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	77.96714833	15.59342967	5.59	0.0003
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	77.96714833	15.59342967	5.59	0.0003

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 46
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=92-95 SEX=M -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T3

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 54 MSE= 215.637
Critical Value of Studentized Range= 4.178
Minimum Significant Difference= 19.403

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	179.837	10	1-CONTROL
B	157.464	10	2----0.01
C	125.037	10	3----0.05
C	123.209	10	4----0.20
C	121.792	10	5----1.00
C	117.147	10	6---10.00

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 47
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=92-95 SEX=M -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: TSH

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 54 MSE= 2.789458
Critical Value of Studentized Range= 4.178
Minimum Significant Difference= 2.2068

Means with the same letter are not significantly different.

Tukey Grouping		Mean	N	TRT
	A	19.0570	10	6---10.00
	A			
B	A	19.0400	10	5----1.00
B	A			
B	A	18.9700	10	4----0.20
B	A			
B	A C	17.8340	10	3----0.05
B	C			
B	C	16.8410	10	2----0.01
	C			
	C	16.1870	10	1-CONTROL

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 48
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=97-123 SEX=F -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
SEX	1	F
TRT	4	1-CONTROL 3---0.05 5---1.00 6---10.00

Number of observations in by group = 40

NOTE: All dependent variable are consistent with respect to the presence or absence of missing values. However
only 39 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 49
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=97-123 SEX=F -----

General Linear Models Procedure

Dependent Variable: T3

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	3776.90856308	1258.96952103	3.15	0.0372
Error	35	14001.32076000	400.03773600		
Corrected Total	38	17778.22932308			
	R-Square	C.V.	Root MSE		T3 Mean
	0.212446	9.399109	20.00094338		212.79615385

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	3	3776.90856308	1258.96952103	3.15	0.0372
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	3	3776.90856308	1258.96952103	3.15	0.0372

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 50
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=97-123 SEX=F -----

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	56.36526000	18.78842000	8.66	0.0002
Error	35	75.93214000	2.16948971		
Corrected Total	38	132.29740000			
		R-Square	C.V.	Root MSE	TSH Mean
		0.426050	9.747973	1.47291877	15.11000000
Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	3	56.36526000	18.78842000	8.66	0.0002
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	3	56.36526000	18.78842000	8.66	0.0002

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 51
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=97-123 SEX=F -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T3

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 35 MSE= 400.0377
Critical Value of Studentized Range= 3.814
Minimum Significant Difference= 24.456
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 9.72973

Means with the same letter are not significantly different.

Tukey Grouping		Mean	N	TRT
	A	223.722	10	1-CONTROL
	A			
B	A	215.997	9	3----0.05
B	A			
B	A	214.662	10	5----1.00
B	B			
B	B	197.124	10	6---10.00

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 52
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=97-123 SEX=F -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: TSH

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 35 MSE= 2.16949
Critical Value of Studentized Range= 3.814
Minimum Significant Difference= 1.801
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 9.72973

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	16.0210	10	6---10.00
A	15.7530	10	5----1.00
A	15.6433	9	3----0.05
B	13.0760	10	1--CONTROL

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 53
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=97-123 SEX=M -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
SEX	1	M
TRT	4	1-CONTROL 3----0.05 5----1.00 6---10.00

Number of observations in by group = 40

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 54
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=97-123 SEX=M -----

General Linear Models Procedure

Dependent Variable: T3

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	5360.76753000	1786.92251000	4.52	0.0086
Error	36	14228.34226000	395.23172944		
Corrected Total	39	19589.10979000			

R-Square	C.V.	Root MSE	T3 Mean
0.273661	9.771201	19.88043585	203.45950000

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	3	5360.76753000	1786.92251000	4.52	0.0086
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	3	5360.76753000	1786.92251000	4.52	0.0086

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 55
 PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
 NOTE: T3 AND TSH DATA ONLY

----- DAY=97-123 SEX=M -----

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	20.81331000	6.93777000	1.98	0.1349
Error	36	126.36788000	3.51021889		
Corrected Total	39	147.18119000			
		R-Square	C.V.	Root MSE	TSH Mean
		0.141413	8.594499	1.87355782	21.79950000
Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	3	20.81331000	6.93777000	1.98	0.1349
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	3	20.81331000	6.93777000	1.98	0.1349

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 56
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=97-123 SEX=M -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T3

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 36 MSE= 395.2317
Critical Value of Studentized Range= 3.809
Minimum Significant Difference= 23.945

Means with the same letter are not significantly different.

Tukey Grouping		Mean	N	TRT
	A	214.187	10	3----0.05
	A	211.604	10	5----1.00
B	A	203.420	10	1-CONTROL
	B			
	B	184.627	10	6---10.00

1
WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 57
PROC GLM - STEPDOWN ANOVAS BY DAY AND SEX - MAIN EFFECT OF TRT
NOTE: T3 AND TSH DATA ONLY

----- DAY=97-123 SEX=M -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: TSH

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 36 MSE= 3.510219
Critical Value of Studentized Range= 3.809
Minimum Significant Difference= 2.2566

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	22.7880	10	6---10.00
A	22.1520	10	5----1.00
A	21.3300	10	3----0.05
A	20.9280	10	1-CONTROL

1

WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 58
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: T3 DATA FOR DAY 120 ONLY

----- DAY=97-123 -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	1-CONTROL 3----0.05 5----1.00 6---10.00

Number of observations in by group = 79

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 59
 PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
 NOTE: T3 DATA FOR DAY 120 ONLY

----- DAY=97-123 -----

General Linear Models Procedure

Dependent Variable: T3

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	7955.06851526	2651.68950509	6.39	0.0006
Error	75	31133.66355816	415.11551411		
Corrected Total	78	39088.73207342			
	R-Square	C.V.	Root MSE		T3 Mean
	0.203513	9.792141	20.37438377		208.06873418
Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	3	7955.06851526	2651.68950509	6.39	0.0006
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	3	7955.06851526	2651.68950509	6.39	0.0006

1

WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 60
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: T3 DATA FOR DAY 120 ONLY

----- DAY=97-123 -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T3

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 75 MSE= 415.1155
Critical Value of Studentized Range= 3.716
Minimum Significant Difference= 17.04
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 19.74026

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	215.044	19	3----0.05
A	213.571	20	1-CONTROL
A	213.133	20	5----1.00
B	190.876	20	6---10.00

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 61
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: TSH DATA FOR DAY 90 or 120 ONLY

----- DAY=92-95 -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	6	1-CONTROL 2----0.01 3----0.05 4----0.20 5----1.00 6---10.00

Number of observations in by group = 119

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 62
 PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
 NOTE: TSH DATA FOR DAY 90 or 120 ONLY

----- DAY=92-95 -----

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	136.37179085	27.27435817	9.48	0.0001
Error	113	325.16107974	2.87753168		
Corrected Total	118	461.53287059			
		R-Square C.V.	Root MSE		TSH Mean
		0.295476 9.552983	1.69632888		17.75705882
Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	136.37179085	27.27435817	9.48	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	136.37179085	27.27435817	9.48	0.0001

1

WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: TSH DATA FOR DAY 90 or 120 ONLY

19:39 Tuesday, October 6, 1998 63

----- DAY=92-95 -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: TSH

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 113 MSE= 2.877532
Critical Value of Studentized Range= 4.100
Minimum Significant Difference= 1.562
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 19.82609

Means with the same letter are not significantly different.

Tukey Grouping		Mean	N	TRT
A	A	19.5435	20	6---10.00
B	A	18.3705	19	5----1.00
B	A	18.1745	20	4----0.20
B	B	17.3395	20	3----0.05
B	C	16.8120	20	2----0.01
C	C	16.3330	20	1-CONTROL

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 64
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: TSH DATA FOR DAY 90 or 120 ONLY

----- DAY=97-123 -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	1-CONTROL 3----0.05 5----1.00 6---10.00

Number of observations in by group = 80

NOTE: Due to missing values, only 79 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 65
 PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
 NOTE: TSH DATA FOR DAY 90 or 120 ONLY

----- DAY=97-123 -----

General Linear Models Procedure

Dependent Variable: TSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	65.68999827	21.89666609	1.50	0.2224
Error	75	1097.44783211	14.63263776		
Corrected Total	78	1163.13783038			
		R-Square	C.V.	Root MSE	TSH Mean
		0.056477	20.68035	3.82526310	18.49708861
Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	3	65.68999827	21.89666609	1.50	0.2224
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	3	65.68999827	21.89666609	1.50	0.2224

1

WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 66
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: TSH DATA FOR DAY 90 or 120 ONLY

----- DAY=97-123 -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: TSH

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 75 MSE= 14.63264
Critical Value of Studentized Range= 3.716
Minimum Significant Difference= 3.1993
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 19.74026

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	19.405	20	6---10.00
A	18.952	20	5----1.00
A	18.636	19	3----0.05
A	17.002	20	1-CONTROL

1
WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 67
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: T4 DATA ONLY

----- DAY=15-18 -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	6	1-CONTROL 2----0.01 3----0.05 4----0.20 5----1.00 6---10.00

Number of observations in by group = 120

NOTE: Due to missing values, only 113 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 68
 PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
 NOTE: T4 DATA ONLY

----- DAY=15-18 -----

General Linear Models Procedure

Dependent Variable: T4

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	12.57293160	2.51458632	5.82	0.0001
Error	107	46.20894096	0.43185926		
Corrected Total	112	58.7187257			
		R-Square	C.V.	Root MSE	T4 Mean
		0.213891	14.22751	0.65716000	4.61893805
Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	12.57293160	2.51458632	5.82	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	12.57293160	2.51458632	5.82	0.0001

1

WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 69
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: T4 DATA ONLY

----- DAY=15-18 -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T4

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 107 MSE= 0.431859
Critical Value of Studentized Range= 4.104
Minimum Significant Difference= 0.6247
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 18.6376

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	5.0660	20	1-CONTROL
A	4.7089	19	3----0.05
A	4.6947	19	4----0.20
A	4.6475	20	5----1.00
A	4.6333	15	2----0.01
B	3.9750	20	6---10.00

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 70
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: T4 DATA ONLY

----- DAY=92-95 -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	6	1-CONTROL 2----0.01 3----0.05 4----0.20 5----1.00 6---10.00

Number of observations in by group = 120

NOTE: Due to missing values, only 119 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 71
 PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
 NOTE: T4 DATA ONLY

----- DAY=92-95 -----

General Linear Models Procedure

Dependent Variable: T4

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	39.18250137	7.83650027	41.33	0.0001
Error	113	21.42547342	0.18960596		
Corrected Total	118	60.60797479			
		R-Square	C.V.	Root MSE	T4 Mean
		0.646491	11.91334	0.43543766	3.65504202
Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	39.18250137	7.83650027	41.33	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	39.18250137	7.83650027	41.33	0.0001

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 72
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: T4 DATA ONLY

----- DAY=92-95 -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T4

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 113 MSE= 0.189606
Critical Value of Studentized Range= 4.100
Minimum Significant Difference= 0.401
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 19.82609

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	4.7505	20	1-CONTROL
B	3.9385	20	2----0.01
C	3.5135	20	3----0.05
C	3.4410	20	4----0.20
C	3.3326	19	5----1.00
D	2.9380	20	6---10.00

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 73
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: T4 DATA ONLY

----- DAY=97-123 -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	1-CONTROL 3----0.05 5----1.00 6---10.00

Number of observations in by group = 80

NOTE: Due to missing values, only 79 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 74
 PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
 NOTE: T4 DATA ONLY

----- DAY=97-123 -----

General Linear Models Procedure

Dependent Variable: T4

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	9.32907681	3.10969227	9.35	0.0001
Error	75	24.93958395	0.33252779		
Corrected Total	78	34.26866076			
		R-Square	C.V.	Root MSE	T4 Mean
		0.272233	15.55911	0.57665222	3.70620253
Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	3	9.32907681	3.10969227	9.35	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	3	9.32907681	3.10969227	9.35	0.0001

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 75
PROC GLM - STEPDOWN ANOVAS BY DAY - MAIN EFFECT OF TRT
NOTE: T4 DATA ONLY

----- DAY=97-123 -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T4

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 75 MSE= 0.332528
Critical Value of Studentized Range= 3.716
Minimum Significant Difference= 0.4823
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 19.74026

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	4.2195	20	1-CONTROL
B	3.7189	19	3----0.05
B	3.6235	20	5----1.00
B	3.2635	20	6---10.00

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 76
PROC GLM - STEPDOWN ANOVAS BY SEX - MAIN EFFECT OF TREATMENT
NOTE: T4 DATA ONLY

----- SEX=F -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	6	1-CONTROL 2----0.01 3----0.05 4----0.20 5----1.00 6---10.00

Number of observations in by group = 160

NOTE: Due to missing values, only 157 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 77
 PROC GLM - STEPDOWN ANOVAS BY SEX - MAIN EFFECT OF TREATMENT
 NOTE: T4 DATA ONLY

----- SEX=F -----

General Linear Models Procedure

Dependent Variable: T4

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	14.03242661	2.80648532	9.48	0.0001
Error	151	44.68265110	0.29591160		
Corrected Total	156	58.71507771			

R-Square	C.V.	Root MSE	T4 Mean
0.238992	14.71527	0.54397757	3.69668790

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	14.03242661	2.80648532	9.48	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	14.03242661	2.80648532	9.48	0.0001

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 78
PROC GLM - STEPDOWN ANOVAS BY SEX - MAIN EFFECT OF TREATMENT
NOTE: T4 DATA ONLY

----- SEX=F -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T4

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 151 MSE= 0.295912
Critical Value of Studentized Range= 4.082
Minimum Significant Difference= 0.4425
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 25.18218

Means with the same letter are not significantly different.

Tukey Grouping	Mean	N	TRT
A	4.1393	30	1-CONTROL
A			
B	3.9220	20	2----0.01
B			
B	3.7632	19	4----0.20
B			
B	3.6803	29	3----0.05
B			
B	3.5269	29	5----1.00
C			
C	3.2417	30	6---10.00

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 79
PROC GLM - STEPDOWN ANOVAS BY SEX - MAIN EFFECT OF TREATMENT
NOTE: T4 DATA ONLY

SEX=M -----

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	6	1-CONTROL 2----0.01 3----0.05 4----0.20 5----1.00 6---10.00

Number of observations in by group = 160

NOTE: Due to missing values, only 154 observations can be used in this analysis.

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 80
 PROC GLM - STEPDOWN ANOVAS BY SEX - MAIN EFFECT OF TREATMENT
 NOTE: T4 DATA ONLY

----- SEX=M -----

General Linear Models Procedure

Dependent Variable: T4

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	44.32007843	8.86401569	16.00	0.0001
Error	148	82.00038391	0.55405665		
Corrected Total	153	126.32046234			
		R-Square	C.V.	Root MSE	T4 Mean
		0.350854	17.12683	0.74434982	4.34610390
Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	5	44.32007843	8.86401569	16.00	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	5	44.32007843	8.86401569	16.00	0.0001

1 WPAFB 90-DAY PERCHLORATE K0799 - T3, T4 AND TSH DATA 19:39 Tuesday, October 6, 1998 81
PROC GLM - STEPDOWN ANOVAS BY SEX - MAIN EFFECT OF TREATMENT
NOTE: T4 DATA ONLY

SEX=M -----

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: T4

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 148 MSE= 0.554057
Critical Value of Studentized Range= 4.083
Minimum Significant Difference= 0.6219
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 23.89016

Means with the same letter are not significantly different.

Tukey Grouping		Mean	N	TRT
	A	5.2180	30	1-CONTROL
B	A	4.6553	15	2----0.01
B	B	4.3260	20	4----0.20
B	B	4.2645	29	3----0.05
B	B	4.2153	30	5----1.00
	C	3.5427	30	6---10.00